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SUBJECT: PORTUGAL - ENERGY SECTOR OVERVIEW

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ENERGY SECTOR OVERVIEW

¶1. Portugal, a country with just over 10 million inhabitants, is heavily dependent on energy imports, with foreign sources providing over 80% of its primary energy resources. Crude oil and natural gas imports comprise 63% and 13% of the total, with coal accounting for 3-5%. Domestic Renewable Energy Sources (RES) fluctuate between 10-20% depending on climactic conditions.

¶2. Efforts to alleviate this heavy dependence can be seen throughout Portugal's National Energy Policy which focuses on supply diversification and liberalization of the gas and electricity markets. Beyond seeking new energy suppliers and exploration opportunities for natural gas and crude oil, the plan calls for the increased role of RES in electricity production and facilitates access for third-party suppliers to select transport, distribution and supply systems.

¶3. Furthermore, Prime Minister Socrates announced in early January that the GOP would contribute to the fight against climate change by increasing Portugal's production of electricity from RES from 39% to 45% by 2010, and by substituting between 5% and 10% of coal usage with biomass or other alternatives.

THE CRUDE OIL SECTOR

¶4. In 2005, crude oil accounted for approximately 63% of Portugal's total primary energy supply, down 5% since the 1997 introduction of natural gas to the energy market. The transportation sector consumes around 43% of crude oil while the industrial sector consumes 28%.

¶5. Portugal imports all of its crude oil, with OECD countries providing 75% and Galp Energia) the national gas company - supplying the remaining 25%. Nigeria and Saudi Arabia are the top two individual suppliers at 23% and 16%, respectively. Galp Energia, which dominates the domestic storage, transportation, distribution and retail sectors, generates 43% of its crude oil imports from exploration projects in Angola and Brazil.

¶6. The crude oil sector has not been liberalized. European Commission Directive 2003/55 on the Internal Gas Market allows Portugal to delay market liberalization until 2008. As such, the current national energy policy does not call for the full liberalization of the crude oil or natural gas markets; however, it does allow select third-party suppliers

access to storage facilities, terminals, and transmission and distribution grids.

THE NATURAL GAS SECTOR

¶7. In 2005, natural gas accounted for approximately 13% of the primary energy supply and saw a sales increase of 5% in the commercial and residential markets and 6% in the industrial market from 2004. These increases are due to low electricity production from hydropower, which like other RES, fluctuates based on rainfall and climate. Natural gas usage is expected to continue to grow between 4-6% annually until a new energy source is introduced on the market or until renewable energy systems become more efficient and dependable.

¶8. Portugal has an almost 100% natural gas dependency on two international suppliers, Sonatrach of Algeria and Liquefied Natural Gas of Nigeria, which respectively supply 61% and 37% of all natural gas. As with crude oil, Galp Energia dominates the natural gas distribution, storage, and retail markets.

¶9. Natural gas from Algeria is imported via the Maghreb-Europe Gas Pipeline (also known as the Pedro Duran Farrel pipeline) which starts at Algeria's Hassi R'mel field and passes through Morocco and Spain. Liquefied natural gas (LNG) from Nigeria is imported via the Sines Port Terminal located 150km south of Lisbon on the Atlantic coast.

¶10. In an effort to diversify suppliers of natural gas, Portugal entered into discussions with Russia's Gazprom in early 2006, including the possibility of joint exploration between Gazprom and Galp Energia in Angola. In 2007, the GOP also began talks with Algeria's Sonatrach about joint

exploration opportunities with Galp Energia in other parts of Western Africa. To date, no formal agreements have been signed with either country.

THE COAL SECTOR

¶11. All coal, which represents 3-5% of Portugal's primary energy supply, is imported - mainly from South Africa (40%), Colombia (25%), Australia (15%) and Indonesia (11%). Its usage, mostly for electricity generation in the industrial sector, has declined steadily over the last decade due to the 1997 introduction of natural gas to the domestic energy market.

¶12. As part of the National Energy Policy, the Prime Minister in January 2007 called for 5-10% of the coal used in energy production to be replaced by biomass and other alternatives. While decreasing dependence on coal, the plan does not intend to completely eliminate coal from its energy mix, according to the Ministry of Economy.

THE ELECTRICITY SECTOR

¶13. Portugal generates approximately 86% of its own electricity and imports 13-15% from Spain via an interconnected grid. Energias de Portugal (EDP) dominates the domestic electricity sector and owns significant generating and distribution assets throughout the Iberian region.

¶14. Unlike the oil and gas sectors, Portugal's national energy policy calls for the liberalization of the electricity sector. Legislation adopted in 2005 permits third-party suppliers to buy and sell electricity to consumers. However, while the new legislation has helped to open the market, consumers often experience problems when switching providers as viable transfer rules and regulations have yet to be drafted. Electricity rates per inhabitant are also among the highest in Europe.

¶15. In 2001, Portugal and Spain signed a protocol to create a joint Iberian electricity market - the Mercado Iberico de

Electricidade (MIBEL)) which will completely integrate both electricity markets and regulate the costs of energy while increasing the workability of regional electricity grids. Due to regulatory delays on both sides, the MIBEL project has not yet been implemented.

THE RENEWABLE ENERGY SOURCES (RES) SECTOR

¶16. In 2005, RES accounted for 10% of electricity production, down from around 20% in 2004. Approximately two-thirds of energy produced by RES comes from hydropower. However, droughts in 2005 resulted in a reduction of energy produced by hydropower.

¶17. Portugal's terrain offers many opportunities for RES; wave energy along the Atlantic coast, solar energy in the south, and hydro and wind energies in the central and northern parts of the country. In general, the country has a mild Mediterranean climate with the southern half warm and dry, and the northern and interior regions cooler with considerable rainfall. The three main rivers, Douro, Tagus and Guadiana, provide excellent opportunities for small/large hydropower production.

¶18. The National Energy Policy on RES is based on the Kyoto Protocol and the European Commission's 2001/77 directive on energy consumption and environmental protection. In January, the Prime Minister announced that the GOP planned to increase its production of electricity from RES from 39% to 45% by ¶2010. The goal of 39%, set in 2001, was considered quite ambitious in comparison to the EU target of 12%. Some GOP members, while supportive of the policy's intent, question whether the bar has been set too high.

¶19. The new legislation also increases Portugal's biofuel targets to 10% by 2010, 4.25% above the EU target, and imposes high taxes on the sales of fluorescent light bulbs that are not energy efficient. Portugal has less than 10 biofuel plants, the largest of which has a capacity of 100,000 tons per year and is owned by Galp Energia. In order to meet its 10% target, Portugal would need to at least double biofuel production. This would likely result in a strain on domestic farmers to produce the needed raw

materials.

¶20. Below are the GOP's current installed RES capabilities and its 2010 goals*:

INSTALLED RES	2006 (MW)	2010 (MW)
Wind	1,637	3,750
Small/Large Hydro	4,801	5,400
Biomass w/ Cogeneration	12	150
Solid Waste	88	130
Biogas	8	50
Wave	3	50
Photovoltaic	3	150
Geothermal	18	30

SOURCE: DGGE (Direccao-Geral de Geologia e Energia)
*Goals for RES at 39% (goals for RES at 45% are yet to be published)

¶21. To achieve these 2010 goals, the GOP has granted RES companies special tax incentives, subsidies, and investment grants. American companies, such as General Electric and the PowerLight Corporation, have already taken advantage of these subsidies by investing $75 million in an 11MW solar energy plant in the south of Portugal (see reftel). When completed in early 2007, it will be the largest photovoltaic plant in the world, provide electricity to 8,000 homes, and save over 30,000 tons of greenhouse gas emissions per year.

COMMENT

¶22. Portugal will remain heavily dependent on non-EU imports for the foreseeable future despite concerted efforts to diversify its energy supply. Towards this end, it has been actively cultivating ties with Russia and the Maghreb, with the Foreign and Economic Ministers having traveled to Algeria, Libya and Morocco in recent months. Closer to home, the GOP has proposed a highly ambitious RES program. While it may fall short of its targets, the GOP should be applauded for its campaign to attract RES investment. With regard to nuclear energy, the current Administration has stated that they are not pursuing a program, though acknowledge that future governments may be inclined to do so.
Hoffman